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ABSTRACT

A survey test in mathematics (see TM 000 965) was administered to all pupils in Grade 7 of the Vancouver School System. Test content included arithmetic fundamentals, modern mathematical concepts and mathematical applications in problem solving. A summary of test results is presented in three tables. (CK)

ED 058254

RESEARCH REPORT

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Survey of Achievement in Mathematics in Grade 7 of Vancouver Schools May 25-28, 1971

June 18, 1971

E. N. Ellis

Research Report 71-12

Department of Planning and Evaluation
Board of School Trustees
1595 West 10th Avenue
Vancouver 9, B. C.

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TM 000 964 — 965

SURVEY OF ACHIEVEMENT IN MATHEMATICS

IN GRADE 7 OF VANCOUVER SCHOOLS

MAY 25-28, 1971.

June 18, 1971.

E. N. Ellis

Research Report 71-12

Department of Planning and Evaluation
Board of School Trustees,
1595 West 10th Avenue,
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Survey of Achievement in Mathematics in Grade 7 of Vancouver Schools, May 25-28, 1971.

A survey test in Mathematics was administered to all pupils (N=5, 292) in Grade 7 of Vancouver Schools during the week of May 25-28, 1971.

The original form of this test (Form 68) was designed in 1968 to cover the new course of study in Mathematics 7. Its content included arithmetic fundamentals, modern mathematical concepts, and the application of mathematics in solving problems. There were 48 items to be completed within a time-limit of 70 minutes. For the present test, three items were deleted and a few minor revisions were made. A copy of the test is attached.

It is not possible to make direct comparisons of results with those of 1968 because of the changes made in the test. Results for these two years are summarized in Table I.

TABLE I: SUMMARY OF RESULTS--SURVEY TEST IN MATHEMATICS - GRADE 7

	1968	1971
Form of Test	68	68 Revised
No. of Pupils	5, 127	5, 292
Possible Score	48	45
Median Score	23. 9	20. 7
Median as a Percentage	50%	46%
Range of Scores	1 - 48	0 - 44
Number of Perfect Scores	2	0
Number of Zero Scores	0	4

Percentile norms are presented in Table II.

TABLE II: SCORES ON THE SURVEY TEST IN MATHEMATICS 7 (FORM 68 REVISED) CORRESPONDING TO SELECTED PERCENTILE LEVELS, BASED ON THE PERFORMANCE OF 5,292 PUPILS IN GRADE 7 OF VANCOUVER SCHOOLS, MAY, 1971.

PERCENTILE	GRADE 7 (Form 68 Revised) N = 5,292
99	40.0
95	35.5
90	32.4
85	30.3
80	28.3
75	26.9
70	25.5
65	24.2
60	23.0
55	21.9
50	20.7
45	19.6
40	18.4
35	17.3
30	16.1
25	15.0
20	13.8
15	12.7
10	10.8
05	8.9
01	4.8

The ranges of scores corresponding to letter grades are indicated in Table III.

TABLE III: RANGES OF SCORES CORRESPONDING TO LETTER GRADES, SURVEY TEST IN MATHEMATICS (FORM 68 REVISED) - GRADE 7, VANCOUVER SCHOOLS, MAY, 1971.

LETTER GRADE	RANGE OF SCORES
A	36 - 45
B	27 - 35
C+	24 - 26
C	19 - 23
C-	16 - 18
D	9 - 15
E	0 - 8

June 18, 1971.

TM 000 965
ED 058255

THE BOARD OF SCHOOL TRUSTEES OF SCHOOL DISTRICT NO. 39 (VANCOUVER)
DEPARTMENT OF RESEARCH AND SPECIAL SERVICES

SURVEY TEST

in

MATHEMATICS

GRADE 7

FORM 68 (REVISED)

(Time Limit: 70 minutes)

Pupil's Name _____
(First Name) (Last Name)

School _____ Date _____

Division Number _____

Score _____

Select the best answer for each of the following and place its letter in the space provided at the right.

1. Multiplying $\frac{1}{3} \times \frac{1}{3}$ gives: (A) $\frac{1}{3}$ (B) $\frac{1}{9}$ (C) $\frac{2}{9}$

   (D) $\frac{2}{6}$ (E) $\frac{2}{3}$ (F) None of these Answer: 1. _____

2. The lowest common multiple (L. C. M.) of 12, 24, and 36 is:

   (A) 3 (B) 12 (C) 48

   (D) 72 (E) 144 (F) None of these Answer: 2. _____

3. Which of these products gives the prime factors of 48?

   (A) 4 x 12 (B) 2 x 2 x 3 x 4 (C) 2 x 2 x 2 x 2 x 3

   (D) 16 x 3 (E) 48 x 1 (F) None of these Answer: 3. _____

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4. The marked angle is called:

(A) Obtuse (B) Reflex (C) Acute
(D) Straight (E) Right (F) None of these Answer: 4. _____

5. Two of the three angles of a triangle are 40^o and 25^o. The size of the third angle is:

(A) 15^o (B) 25^o (C) 35^o
(D) 45^o (E) 65^o (F) None of these Answer: 5. _____

6. The value of (50 x 175) - (40 x 175) is:

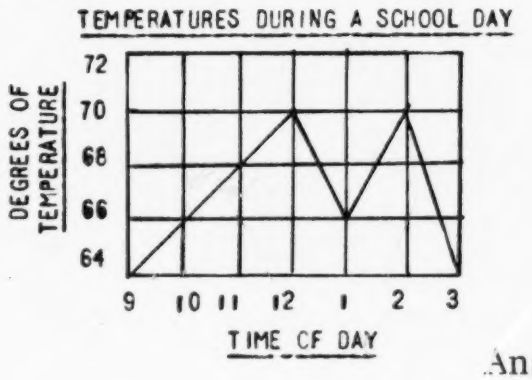
(A) 10 (B) 17.5 (C) 100
(D) 1,750 (E) 175,000 (F) None of these Answer: 6. _____

7. Rounding off .879 to the nearest hundredth gives:

(A) .80 (B) .87 (C) .88
(D) .90 (E) 1.0 (F) None of these Answer: 7. _____

8. The temperature of a classroom is supposed to be about 68^o. How many times during the school day was it 68^o?

(A) 0 (B) 1 (C) 2 (D) 3
(E) 4 (F) None of these



Answer: 8. _____

9. All numbers which are divisible by 48 must also be divisible by:

(A) 10 (B) 14 (C) 28
(D) 32 (E) 36 (F) None of these Answer: 9. _____

10. If $\square + (\triangle + \square) = \diamond$ then $(\square + \triangle) + \square$ is equal to:

(A) $\triangle$ (B) $\diamond$ (C) $\square$
(D) $\square$ (E) 1 (F) None of these Answer: 10. _____

11. The scale of a map is 1 inch = 50 miles. On this map 225 miles would be shown as:

(A) $4\frac{1}{4}$ inches (B) $4\frac{1}{2}$ inches (C) $4\frac{3}{4}$ inches
(D) $5\frac{1}{4}$ inches (E) $5\frac{1}{2}$ inches (F) None of these Answer: 11. _____

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12. To find the average of a number of marks you would:

(A) arrange the marks from lowest to highest and take half the middle mark.
(B) take the highest and the lowest and divide by the number of marks.
(C) arrange the scores from highest to lowest
(D) find the sum of the marks and divide by 2.
(E) find the sum of the marks and divide by the number of marks.
(F) none of these

Answer: 12. _____

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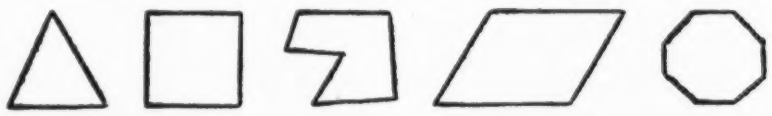
13. The geometric term that best describes all of the figures at the right is:



(A) Quadrilateral (B) Parallelogram (C) Rectangle
(D) Polygon (E) Pentagon (F) None of these

Answer: 13. _____

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14. The set (0, 1) is closed under:

(A) addition (B) subtraction (C) multiplication
(D) division (E) all four operations
(F) none of these

Answer: 14. _____

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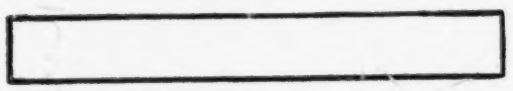
15. A ratio comparing the width of this rectangle with its length would be:



(A) 5:18 (B) 6:5 (C) 5:2
(D) 5:6 (E) 2:5 (F) None of these

Answer: 15. _____

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16. If 200% of a number is 36, the number is:

(A) 18 (B) 72 (C) 0.18
(D) 0.72 (E) 7200 (F) None of these

Answer: 16. _____

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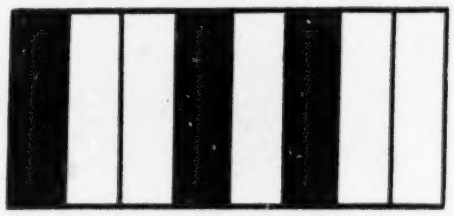
17. In this diagram there are 8 rectangles of equal size. The decimal fraction representing the shaded portion of the diagram is:



(A) .375 (B) .6 (C) .625
(D) .875 (E) 1.6 (F) None of these

Answer: 17. _____

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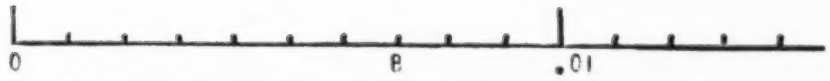
18. 

The decimal fraction which is represented by the point B on the above number line is:

(A) .007 (B) .017 (C) .07

(D) .17 (E) .7 (F) None of these Answer: 18. _____

19. A triangle with all the sides unequal is:

(A) Isosceles (B) Equiangular (C) Scalene

(D) Equilateral (E) Regular (F) None of these Answer: 19. _____

20. Another way of writing 3 x 145 is:

(A) (3 x 5) + (3 x 4) + (3 x 1) (B) (3 x 14) + (3 x 5)

(C) (3 x 140) + (3 x 1) + (5 x 1) (D) (3 x 140) + 5

(E) (3 x 100) + (3 x 40) + (3 x 5) (F) None of these Answer: 20. _____

21. The value of N in $\frac{30}{90} = \frac{45}{N}$ is:

(A) 15 (B) $22\frac{1}{2}$ (C) 60

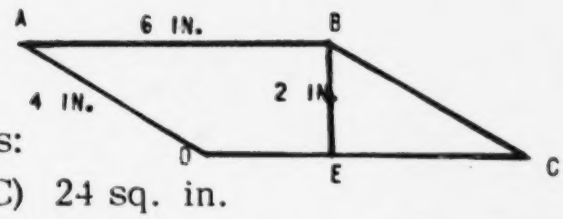
(D) 120 (E) 125 (F) None of these Answer: 21. _____

22. Which of these would you select as the closest approximate value of .35 x 193?

(A) 2 (B) 3.5 (C) 7

(D) 14 (E) 70 (F) 6755 Answer: 22. _____

23. ABCD is a parallelogram with sides of 6 in; 4 in; BE is an altitude of 2 in. The perimeter of parallelogram ABCD is:



(A) 6 sq. in. (B) 12 sq. in. (C) 24 sq. in.

(D) 10 in. (E) 12 in. (F) 20 in. Answer: 23. _____

24. In the finite sequence 1, 3, 7, 15, ____, ____ the missing numbers are:

(A) 31, 63 (B) 23, 33 (C) 25, 37

(D) 17, 21 (E) 20, 25 (F) None of these Answer: 24. _____

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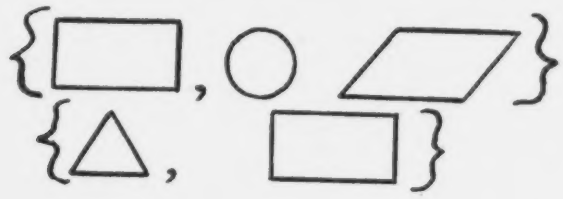
25. These symbols are used to make two sets. Which of these is a true statement about these sets?



(A) The sets are infinite.
(B) The sets are not identical.
(C) The sets can be placed in one-to-one relationship.
(D) The sets are identical.
(E) The sets are empty.
(F) None of these

Answer: 25. _____

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26. $856.4\overline{)1541.52}$ (Select the best answer)

(A) 180 (B) 1.8 (C) .18

(D) 18 (E) 1800 (F) .018 Answer: 26. _____

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27. 30 is what percent of 45?

(A) 60% (B) $66\frac{2}{3}\%$ (C) 75%

(D) 120% (E) 150% (F) None of these Answer: 27. _____

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28. If the prime factors of 6930 are 2 x 3 x 3 x 5 x 7 x 11, which of these is not a divisor of 6930?

(A) 385 (B) 90 (C) 77

(D) 66 (E) 54 (F) 42 Answer: 28. _____

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29. 1. (2 x □) + 1
2. (2 x □) + 2
3. (2 x □) + 3

If the replacement set for □ in these three expressions is the set of whole numbers, which of them will always result in an even whole number?

(A) No. 1 only (B) No. 2 only (C) No. 3 only

(D) No. 1 and 2 only (E) No. 1 and 3 only (F) None of these Answer: 29. _____

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30. Find the equation for which the solution set is an empty set. Replacement set is the set of whole numbers.

(A) □ + 6 = 19 (B) 8 - □ = 5

(C) □ + △ = 20 (D) 14 - □ = 10

(E) △ x △ x △ = 27 (F) None of these Answer: 30. _____

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31. What rate of interest is a bank paying on deposits, if $2000 left for a year becomes $2090?

(A) 4% (B) $4\frac{1}{4}\%$ (C) $4\frac{1}{2}\%$

(D) 5% (E) $5\frac{1}{2}\%$ (F) None of these Answer: 31. _____

32. Which of these operations on whole numbers will <u>never</u> produce a whole number?

(A) (Even number) ÷ (Even number) (B) (Even number) x (Odd number)

(C) (Odd number) x (Odd number) (D) (Even number) x (Even number)

(E) (Odd number) ÷ (Even number) (F) None of these

Answer: 32. _____

33. If an ordered number pair is written ($\square$, $\triangle$) which of the following ordered number pairs satisfies the open numbered sentence?

$$(3 \times \square) + (2 \times \triangle) = 30?$$

(A) (0, 10) (B) 1, 13 (C) 4, 9

(D) (5, 5) (E) (9, 2) (F) None of these Answer: 33. _____

34. An aeroplane travelled 800 miles in $2\frac{1}{2}$ hours. How far would it travel in 45 minutes at the same rate?
(Do not solve, but pick the proportion that you would use to find the answer.)

(A) $\frac{800}{2\frac{1}{2}} = \frac{45}{x}$ (B) $\frac{2\frac{1}{2}}{800} = \frac{45}{x}$ (C) $\frac{800}{2\frac{1}{2}} = \frac{x}{\frac{3}{4}}$

(D) $\frac{800}{2\frac{1}{2}} = \frac{\frac{3}{4}}{x}$ (E) $\frac{800}{150} = \frac{45}{4x}$ (F) None of these Answer: 34. _____

35. In the finite set, (3, 7, 12, 18, . . . 63), the number of elements needed to complete it is:

(A) 2 (B) 3 (C) 4

(D) 5 (E) 6 (F) Infinite Answer: 35. _____

36. Which of the following will not change the value of a number?

(A) Multiplying it by its reciprocal.
(B) Multiplying it by 0.
(C) Multiplying it by 1.
(D) Moving the decimal two places to the left.
(E) Moving the decimal two places to the right.
(F) Adding a % sign to a number.

Answer: 36. _____

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37. The number of hours and minutes between 9:45 a.m. and 6:15 p.m. is:

(A) 3 hr. 15 min. (B) 3 hrs. 30 min. (C) 8 hr. 30 min.

(D) 8 hr. 45 min. (E) 20 hr. 30 min. (F) None of these

Answer: 37. _____

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38. For a lung to expand, the internal pressure must be more than 1/8 pound per square inch greater than the external pressure. If I stands for internal pressure and E for external pressure which of these mathematical sentences is a true statement?

(A) $I > E + 1/8$ (B) $I + 1/8 = E$ (C) $E + 1/8 = I$

(D) $I + 1/8 > E$ (E) $E < 1/8 + I$ (F) None of these Answer: 38. _____

39.

YZ is a line, P a point in it. The number of rays that can be drawn through P is:

(A) 0 (B) 1 (C) 2

(D) 3 (E) 4 (F) Infinite Answer: 39. _____

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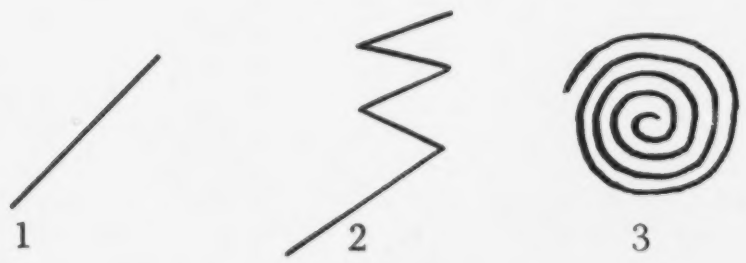
40. 

For the above geometric figures which of these is the correct answer?

(A) Line 1 is a curve but 2 and 3 are not.
(B) Line 2 is a curve but 1 and 3 are not.
(C) Line 3 is a curve but 1 and 2 are not.
(D) Lines 2 and 3 are curves but 1 is not.
(E) Lines 1, 2, 3 are all curves.
(F) None of these Answer: 40. _____

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41. A salesman is paid a salary of $100 per week. He also receives a commission on the sales he makes. What would his total salary be in a week on which his sales were $8000, if the rate of commission is $12\frac{1}{2}\%$?

(A) $110 (B) $200 (C) $990

(D) $1100 (E) $10,100 (F) None of these Answer: 41. _____

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42. An automobile was sold for $2400. This represented a loss of 40% on the original cost price. Find the original cost.

(A) $1440 (B) $3360 (C) $3840

(D) $4000 (E) $6000 (F) None of these Answer: 42. _____

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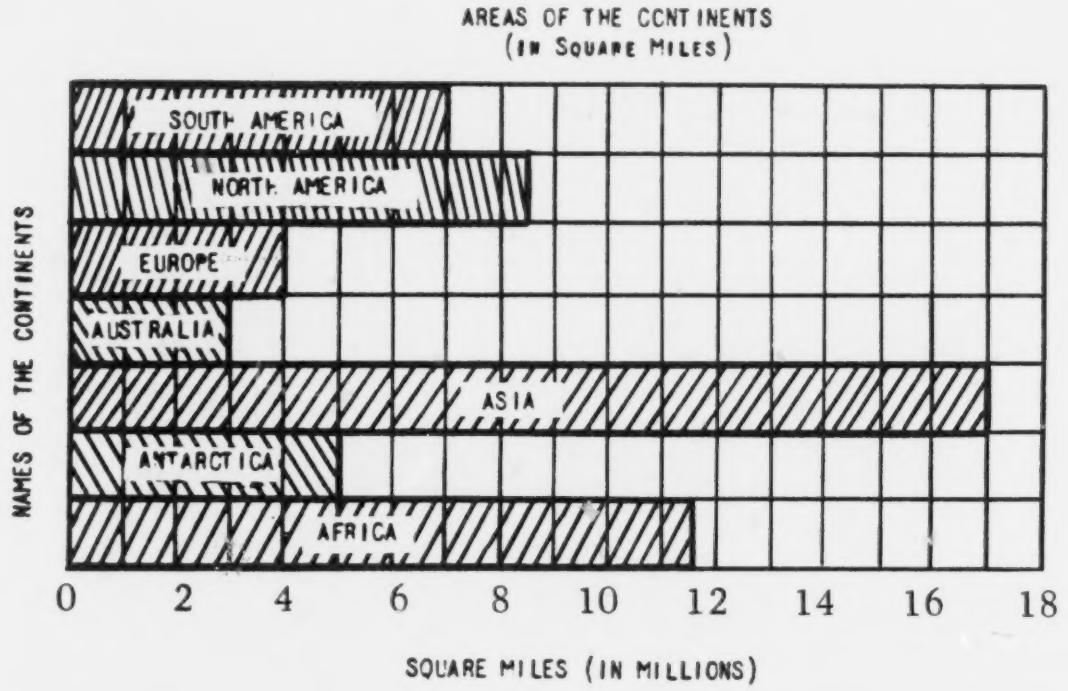
43. The first four prime numbers after 50 are:

(A) 51, 53, 55, 57 (B) 51, 53, 59, 61

(C) 53, 59, 61, 67 (D) 53, 59, 61, 71

(E) 59, 61, 67, 71 (F) None of these Answer: 43. _____

44.



If we were to add the areas of the continents of Africa and Asia (as shown in the graph), and compare this total with the total area of the other five continents, which of the following statements would be true?

(A) The difference of the totals is about 1,000,000 square miles.
(B) The difference of the totals is about 1,500,000 square miles.
(C) The difference of the totals is about 1,750,000 square miles.
(D) The difference of the totals is about 2,000,000 square miles.
(E) The totals would be the same.
(F) None of these

Answer: 44. _____

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45. If Q + R = 50 and P > Q > R > S then:

(A) P + Q = 50 (B) P + R = 50 (C) P + R > 50

(D) Q + S = 50 (E) R + S = 50 (F) Q + S > 50 Answer: 45. _____

GO BACK AND CHECK YOUR WORK.